CLAIMS

I claim:

1. A method for a location determination, comprising:

Acquiring a first positioning signal;

Analyzing the first positioning signal to provide an estimate of a clock signal acceleration;

Acquiring additional positioning signals based on the estimate of the clock signal acceleration; and

Performing the location determination using the first positioning signal and the additional positioning signal.

2. A method as in Claim 1, wherein the additional positioning signals are acquired using a stacking technique.

3. A method as in Claim 1, further comprising validating acquisition of the additional signals.

4. A method as in Claim 1, wherein the first positioning signal is acquired based on a signal-to-noise ratio exceeding a predetermined threshold.

5. A method as in Claim 1, wherein the estimate of the clock signal acceleration is provided using:

Dividing the first positioning signal into a plurality of segments;

Estimating a phase value for a time point in each of the segments;

Fitting the phase values into a parametric model that depends on the phase values and the clock signal acceleration; and

Deriving the clock signal from the parametric model.

6. A method as in Claim 5, wherein parametric model is based on a constant clock signal acceleration.

7. A method as in Claim 5, wherein the parametric model comprises a parabolic function.

8. A method as in Claim 7, the parabolic function comprises as variables the clock signal acceleration, an initial phase value and a clock Doppler.

9. A method as in Claim 5, wherein each phase value of the segments is estimated based on phase values previously estimated.

10. A method as in Claim 5, wherein each phase value is estimated based on a quadrature correlation function.

11. A method as in Claim 1, wherein the estimate of the clock signal acceleration is provided using:

Selecting a set of test clock acceleration values and a set of test clock doppler values based on a clock Doppler estimated from the acquired first positioning signal; and

Choosing one of the test clock acceleration values as the estimate of the clock signal acceleration based on evaluating an ambiguity function using the test clock acceleration values and the test clock Doppler values.

12. A method as in Claim 11, wherein the ambiguity function comprises a magnitude of a complex quadrature phase correlation function.

13. A method as in Claim 11, wherein the test clock acceleration values and the test clock Doppler values are selected based on a first grid and a second grid of the clock acceleration values and the clock Doppler values, the second grid being of a finer grid than the first grid.

14. A system for location determination, comprising:

A GPS receiver front-end integrated circuit that receives a GPS positioning signal and provides a digitized output signal representing the GPS positioning signal;

A non-volatile storage device for storing instruction of a computer program;

A signal processing integrated circuit that receives the digitized output signal of the GPS receiver front-end integrated circuit, retrieves the software program from the non-volatile storage device and executes the instructions to perform:

Acquiring a first positioning signal;

Analyzing the first positioning signal to provide an estimate of a clock signal acceleration;

Acquiring additional positioning signals based on the estimate of the clock signal acceleration; and

Performing a location determination using the first positioning signal and the additional positioning signal.

15. A system as in Claim 14, wherein the additional positioning signals are acquired using a stacking technique.

16. A system as in Claim 14, the signal processing integrated circuit further performs validating acquisition of the additional signals.

17. A system as in Claim 14, wherein the first positioning signal is acquired based on a signal-to-noise ratio exceeding a predetermined threshold.

18. A system as in Claim 14, wherein the estimate of the clock signal acceleration is provided using:

Dividing the first positioning signal into a plurality of segments;

Estimating a phase value for a time point in each of the segments;

Fitting the phase values into a parametric model that depends on the phase values and the clock signal acceleration; and

Deriving the clock signal from the parametric model.

19. A system as in Claim 18, wherein parametric model is based on a constant clock signal acceleration.

20. A system as in Claim 18, wherein the parametric model comprises a parabolic function.

21. A system as in Claim 20, the parabolic function comprises as variables the clock signal acceleration, an initial phase value and a clock Doppler.

22. A system as in Claim 18, wherein each phase value of the segments is estimated based on phase values previously estimated.

23. A system as in Claim 18, wherein each phase value is estimated based on a quadrature correlation function.

24. A system as in Claim 14, wherein the estimate of the clock signal acceleration is provided using:

Selecting a set of test clock acceleration values and a set of test clock doppler values based on a clock Doppler estimated from the acquired first positioning signal; and

Choosing one of the test clock acceleration values as the estimate of the clock signal acceleration based on evaluating an ambiguity function using the test clock acceleration values and the test clock Doppler values.

25. A method as in Claim 24, wherein the ambiguity function comprises a magnitude of a complex quadrature phase correlation function.

26. A method as in Claim 24, wherein the test clock acceleration values and the test clock Doppler values are selected based on a first grid and a second grid of the clock acceleration values and the clock Doppler values, the second grid being of a finer grid than the first grid.